

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,889,965 B2
APPLICATION NO. : 09/974991
DATED : May 10, 2005
INVENTOR(S) : Robert T. Loftus et al.

Page 1 of 10

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

The title page should be deleted and substitute therefore the attached title page.

Drawings:

Delete drawing sheets 1-8, and substitute therefore the drawing sheets, consisting of Figs. 1-8.

(12) **United States Patent**
Loftus et al.

(10) Patent No.: **US 6,889,965 B2**
(45) Date of Patent: **May 10, 2005**

(54) **OPPOSING CONICAL PRELOADED ELASTOMERIC BEARING ASSEMBLY**

(75) Inventors: Robert T. Loftus, Gilbert, AZ (US);
Neal M. Muylaert, Apache Junction, AZ (US)

(73) Assignee: The Boeing Company, Chicago, IL (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 114 days.

(21) Appl. No.: 09/974,991

(22) Filed: Oct. 10, 2001

(65) Prior Publication Data

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(51) Int. Cl.⁷ F16M 1/00

(52) U.S. Cl. 267/136; 416/134 A

(58) Field of Search 416/134 A, 191,
416/244 R, 244 B, 106, 107, 160, 135;
384/221; 267/136

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Primary Examiner—Robert A. Siconolfi

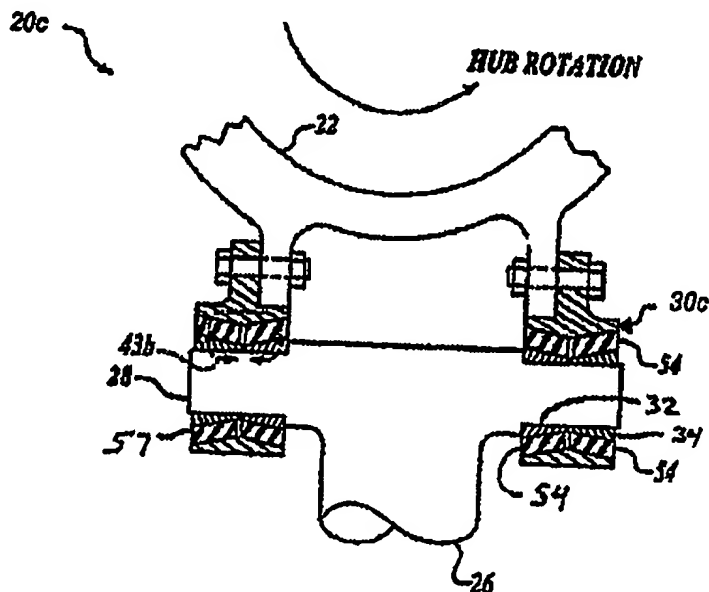
Assistant Examiner—Melanie Torres

(74) Attorney, Agent, or Firm—Black Lowe & Graham PLLC

(57) **ABSTRACT**

The invention provides a weight-reducing bearing assembly for rotary aircraft. An opposed tapered conical elastomeric flap bearing assembly for rotary aircraft includes an outer housing having an outer surface and an inner surface. The outer surface is configured to mechanically connect the bearing assembly to the attachment sections of the hub center body. The inner surface is configured to receive a pair of opposed taper conical bearing elements. An inboard bearing element and an outboard bearing element are located within the outer housing. The bearing elements are arranged in an opposed manner. An axial pre-load can be applied to the opposed bearing assembly wherein the resulting force couple bearing pre-load path is maintained entirely within the bearing assembly. Consequently, the weight of the main rotor hub is reduced increasing the efficiency of rotary flight.

20 Claims, 6 Drawing Sheets



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- at col. 1, line 45, please replace "20aincludes" with -- 20a includes --;
- at col. 1, line 48, please delete "52";
- at col. 2, line 37-38, please replace "is a" with -- shows --, and please replace "view of a bearing assembly" with -- views of bearing assemblies --;
- at col. 2, line 39, please replace "isometric" with -- cross sectional --;
- at col. 2, line 42, please replace "an isometric" with -- a cross sectional --;
- at col. 3, line 3, after "30b", please insert --, as shown in FIG. 3A, --;
- at col. 3, line 10, please replace "yolk" with -- yoke --;
- at col. 3, line 16, after "projections" please insert --, (e.g. bearing assembly 30c shown in FIG. 3B), --;
- at col. 3, line 17, please replace "yolk" with -- yoke --;
- at col. 3, line 20, please replace "3" with -- 3A --, and please replace "an isolated" with -- a partial sectional isolated plan --;
- at col. 3 line 23, please replace "yolk" with -- yoke --;
- at col. 3, line 34, after "exploded" please insert -- cross sectional --;
- at col. 3, line 41, please replace "yolk" with -- yoke -- and please replace "FIG. 1" with -- FIGS. 2 and 3A --;
- at col. 3, line 60, please replace "the proximal" with -- inner bearing --;
- at col. 3, line 61, please replace "section 65" with -- element 32 --;
- at col. 4, line 9, please replace "65" with -- 53 --;
- at col. 4, line 10, please replace "29 (FIG. 1)" with -- 28 (FIG. 2) --;
- at col. 4, line 11, please replace "an assembled" with -- a cross sectional --;

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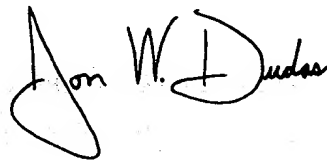
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It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

at col. 4, line 15, please replace "42 encompasses" with -- 42b encompasses --;
at col. 4, line 20, please replace "assembly" with -- element --;
at col. 4, line 22, after "race" please insert -- 66 --, please replace "baring 66" with --bearing --, and after "surface" please insert -- 67 --;
at col. 4, line 27, after "bore" please insert -- 46 --;
at col. 4, line 29, please replace "29" with -- 28 --, and please replace "1" with -- 2 --;
at col. 4, line 30, please delete "58";
at col. 4, line 32, please replace "29" with -- 28 --;
at col. 4, line 33, please delete "to"; and

Signed and Sealed this

Twenty-sixth Day of December, 2006

A handwritten signature in black ink, appearing to read "Jon W. Dudas". The signature is stylized with a large, looped initial "J" and a distinct "D" at the end.

JON W. DUDAS
Director of the United States Patent and Trademark Office

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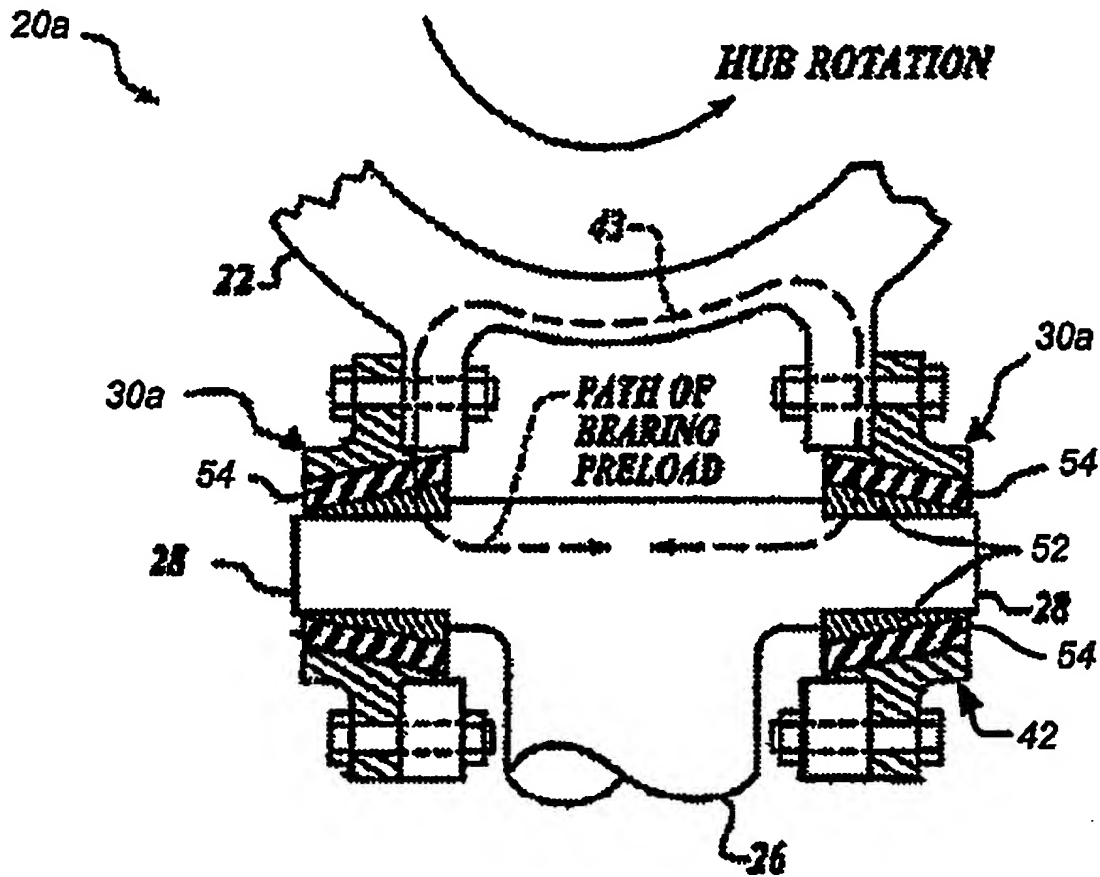


Fig. 1.
(PRIOR ART)

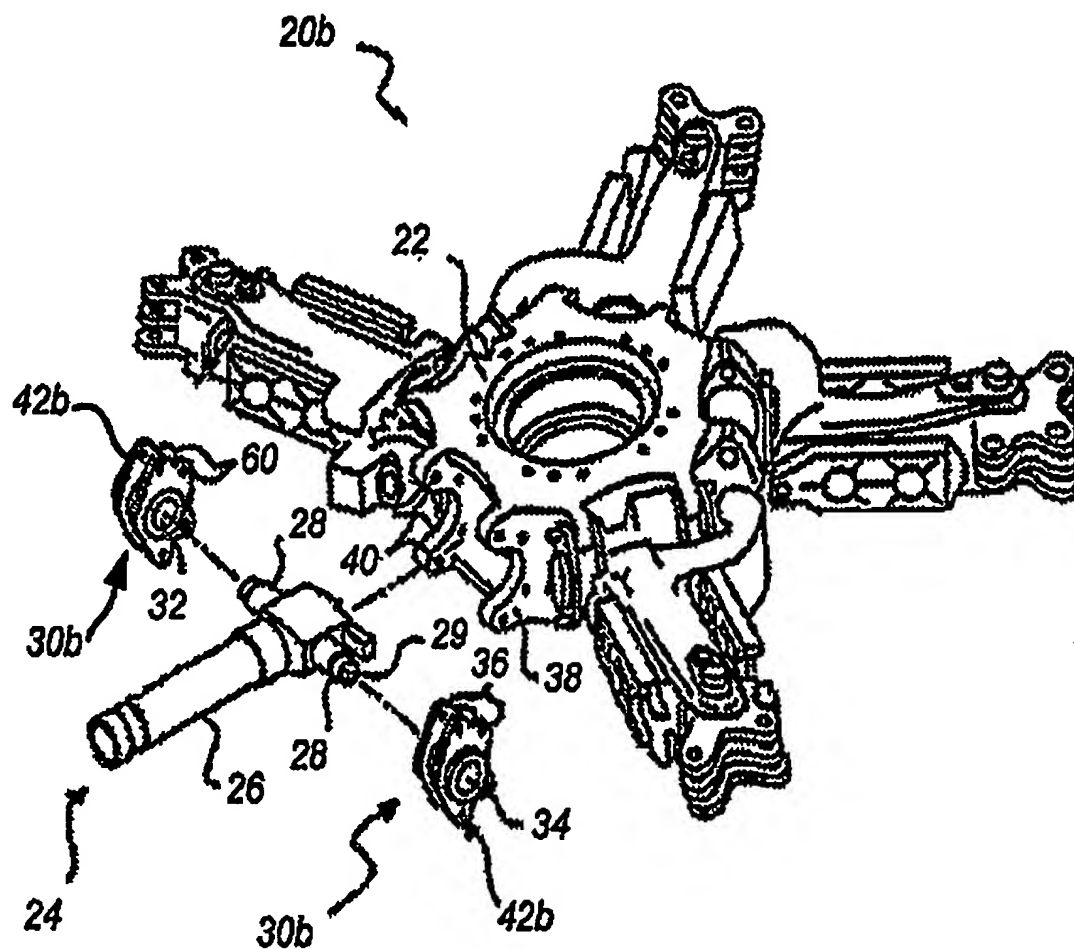


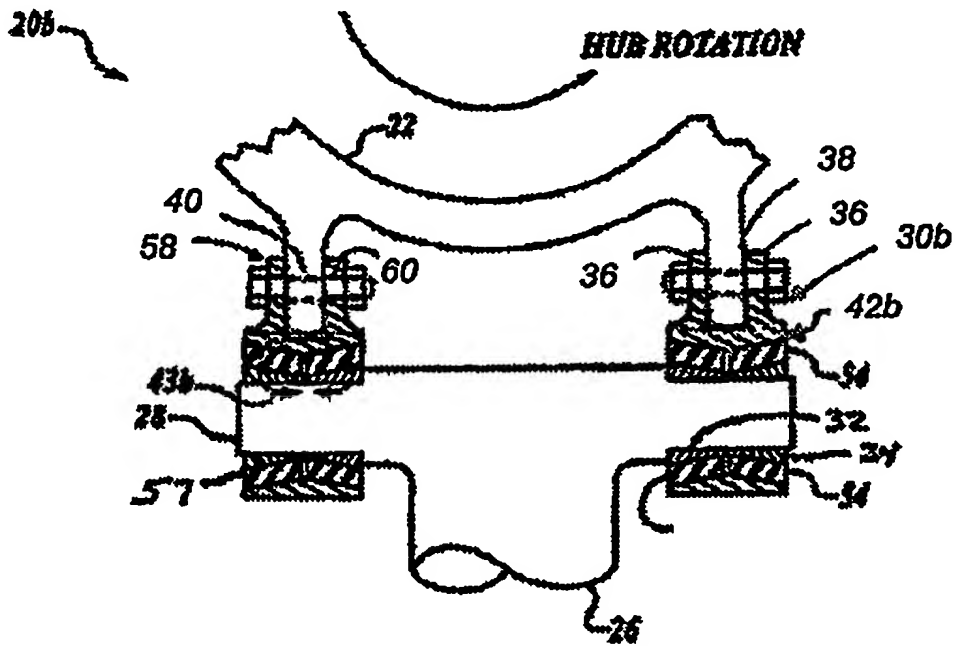
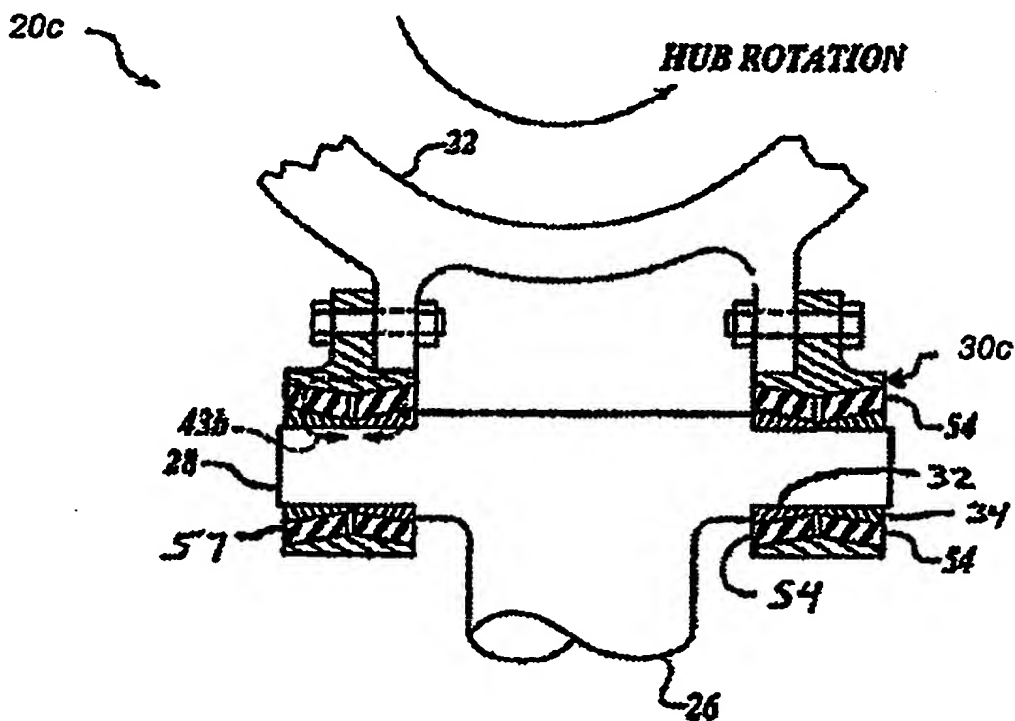
Fig. 2.

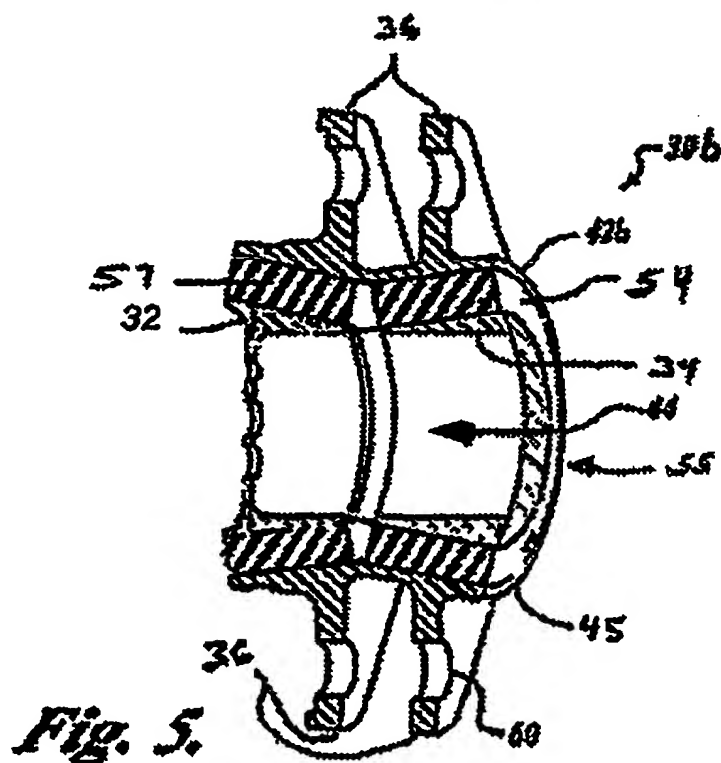
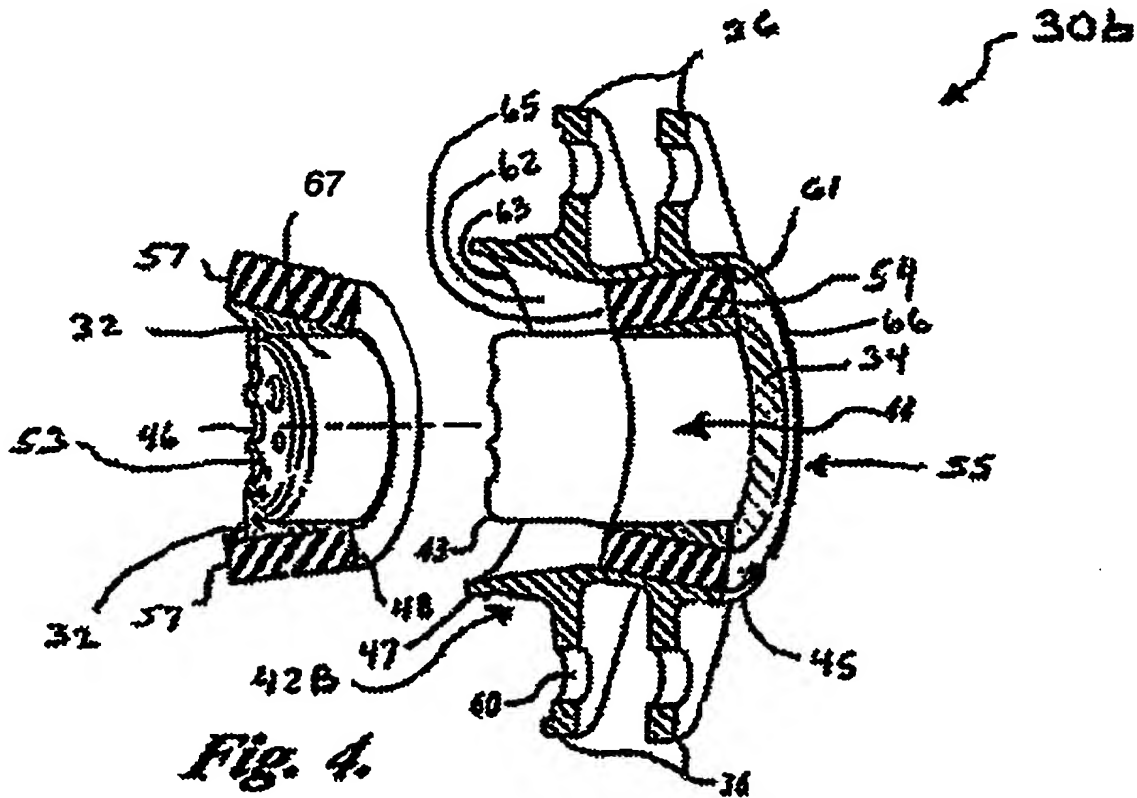
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*Fig. 3A**Fig. 3B*



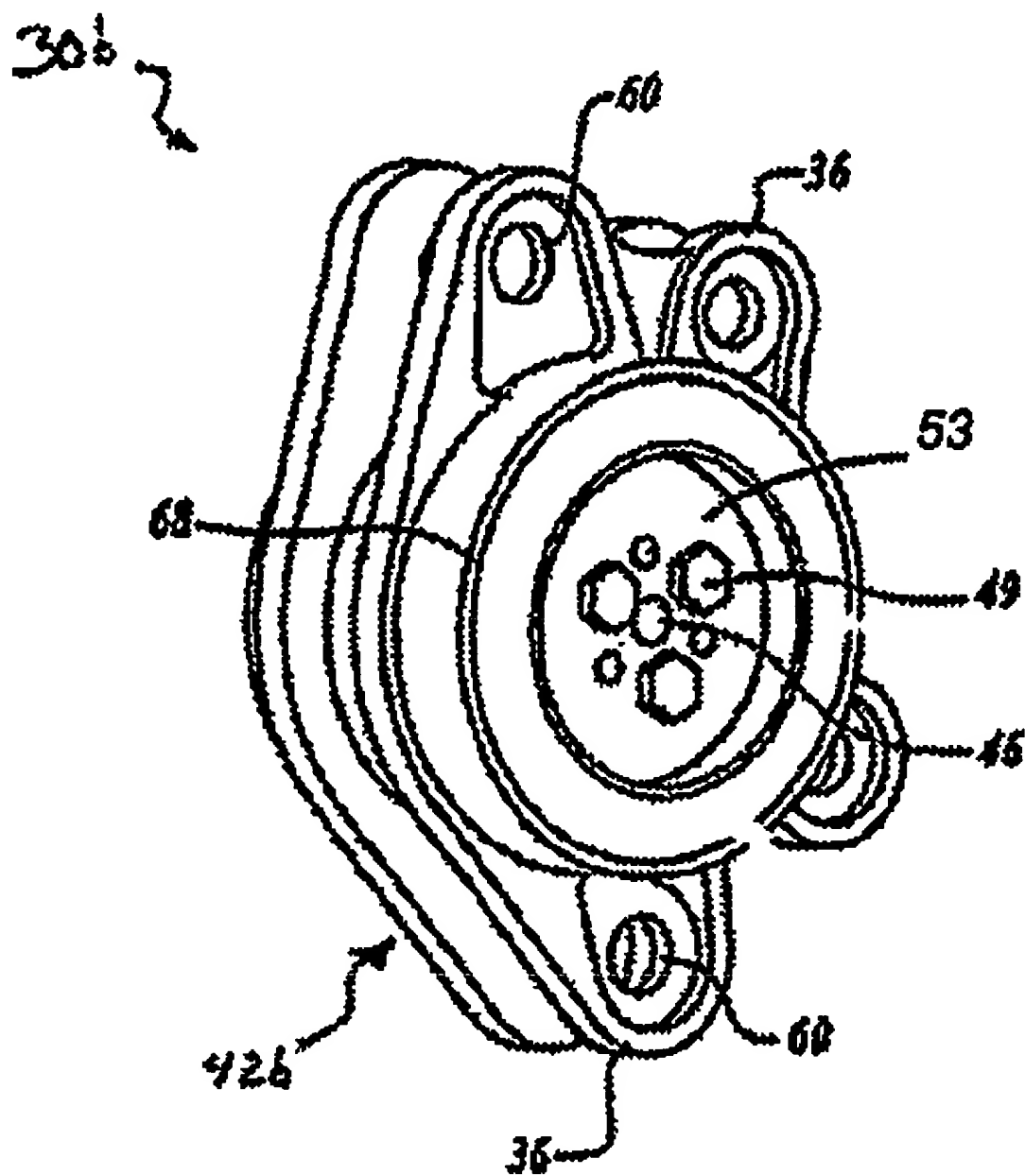


Fig. 6.

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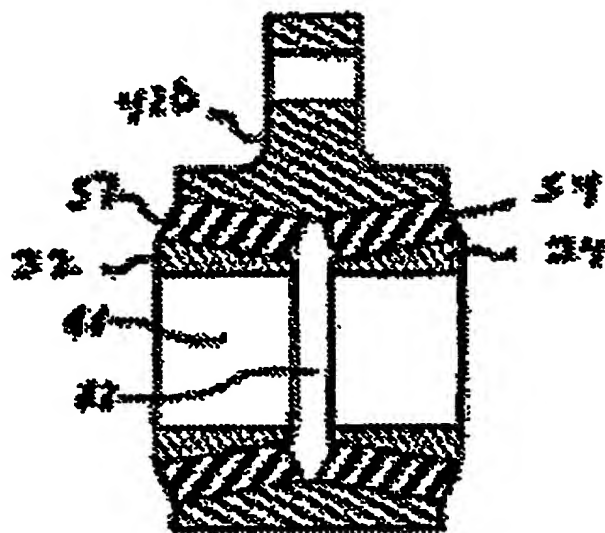


Fig. 7.

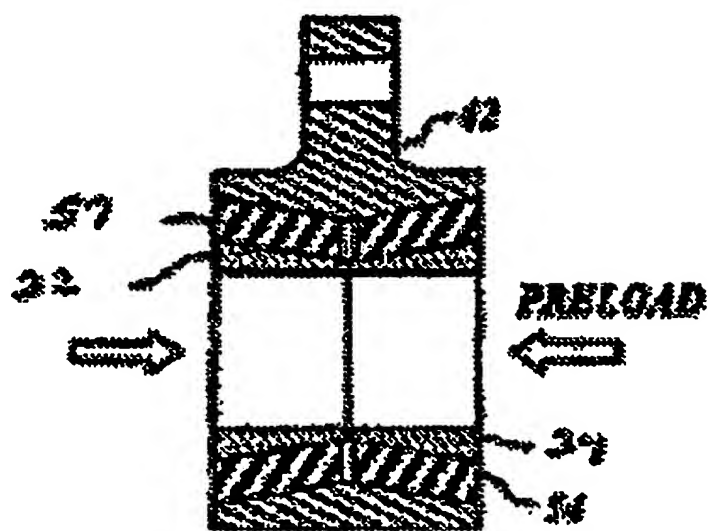


Fig. 8.